REMARKS/ARGUMENTS

Claims Status/Support

Claims 1, 6-18, 24 and 25 are pending. Claims 2-5 and 19-23 were previously cancelled. Claim 14 remains as originally filed. Claims 9 and 24 were previously presented. Claims 1, 6-8, 10-13, 15-18, and 25 have been amended to be consistent with accepted US claim format. Claim 10 has been amended, as supported by the claims and specification as originally filed. Amended Claims 1, 6-8, 10-13, 15-18, and 25 find support, inter alia, in the Claims as originally filed.

Entry and favorable consideration are requested. No new matter has been added.

Summary of the Substance of the Interview

Applicants wish to thank Examiner Miller for the helpful discussion with Applicants' Representatives on May 24, 2010. A draft response including the claims as amended was discussed in detail. In addition, the Examples and the Comparative Examples from the specification of the present application, in particular the table in Figure 1 were discussed.

Regarding the phrase "a shaped expanded graphite article," Applicants' Representative referred to the explanation of page 1 of the specification. The Examiner appeared favorably convinced that the claimed shaped expanded graphite article is different from the vermicular expanded graphite of Olstowski.

The Examiner also indicated that he will likely accept the amended claims without a Request for Continued Examination (RCE).

Arguments

Claims 10-14 are rejected as anticipated or, in the alternative, as obvious over Olstowski (U.S. Pat. No. 3,719,609). Claims 1, 6-9, 24; 15-18; and 25 are rejected as

obvious over Olstowski. Applicants respectfully present the following arguments in their request for reconsideration of the final rejection.

§102(b)/§103(a) Rejections (Claims 10-14)

Amended Claim 10 relates to a method for producing a shaped expanded graphite article having an oxidation-resistant coating layer, comprising

contacting a shaped expanded graphite article with a solution comprising a phosphorus element and a boron element, thereby forming a coating layer of said solution on a surface of said article, and then

subjecting said graphite article to a heat treatment to produce said shaped expanded graphite article comprising said oxidation-resistant coating layer comprising said phosphorus element and said boron element.

In other words, in Claim 10, 1) an oxidation-resistant coating layer is formed on a shaped expanded graphite article, and 2) the coated shaped expanded graphite article is subjected to heat treatment.

In contrast, Olstowski fails to disclose or suggest that an oxidation-resistant coating layer is formed on a shaped expanded graphite article.

In addition, Olstowski does not disclose or suggest the heat treatment of a coated shaped expanded graphite article.

Olstowski discloses heat treatment of a mixture of expanded graphite powder and an oxidation resistant agent. See col. 5, ln. 17-50 and col. 6, ln. 1-6 of the reference which disclose that a solid polymer or other bonding agents can be dissolved in a solvent and then sprayed on the vermicular expanded graphite prior to compaction. The bonding agent-vermicular graphite blend should be baked at a temperature of from 800 to 1200°C.

As such, Olstowski does not anticipate the claimed invention.

Moreover, the specific combination of boron and phosphorus is not disclosed or suggested in Olstowski. While col. 5, ln. 22-23 disclose the use of boron compounds as well as phosphorous compounds, there is no explicit disclosure of the combined use the a B and a P-containing compound. It is also noted that the Examples of Olstowski use only one of the compound and not their combination.

However, the specification of the present invention discloses the advantages obtained when using a combination of B and P for the surprising improvement of the oxidation loss at 800 degrees C. See page 3, ln. 15-17, page 12, ln. 3-9 and the Examples, in particular the table in Figure 1. It is said that in the oxidation resistant coating layer of the present invention, a compound using boron and phosphorus is generated. This compound exhibits better oxidation resistance than that achieved by a compound containing only one of a phosphorus element and a boron element.

A comparison of Examples 1, 2, and 3 according to the present invention with Comparative Examples 1 and 2 shows that when only one of B or P is used, the rate of oxidation loss is very high. In contrast if the combination of B and P is used, the oxidation loss can be reduced dramatically. This cannot be predicted based on Olstowski.

Thus, withdrawal of the rejection over Olstowski is requested.

§103(a) Rejections (Claims 1, 6-9, and 24; and 25)

Amended Claim 1 of the present invention relates to a shaped expanded graphite article having, at least in an outer layer portion, an oxidation-resistant coating layer,

wherein the oxidation-resistant coating layer has a thickness of 0.5 μm or more, and comprises a boron element and a phosphorus element, the **content of the boron element in**

the oxidation-resistant coating layer being 15 mass% or more and **the content of the phosphorus element in the oxidation-resistant coating layer being 2 mass% or more**, and

wherein the **content of the boron element in the oxidation-resistant coating layer is greater than that of the content of the phosphorous element in the oxidation-resistant coating layer.**

Amended Claim 25 relates to shaped expanded graphite article, comprising:

an oxidation resistant coating layer provided to at least an outer layer portion of the shaped expanded graphite article, wherein

the oxidation-resistant coating layer is (i) disposed on the surface of the shaped expanded graphite and at least partially incorporated into the shaped expanded graphite article, (ii) incorporated only to a certain depth of the shaped expanded graphite article, or (iii) incorporated to a core of the shaped expanded graphite article, wherein

the oxidation-resistant coating layer comprises a boron element and a phosphorus element;

a content of the boron element in the oxidation-resistant coating layer is 1 mass% or more;

a content of the phosphorus element in the oxidation-resistant coating layer is 0.1 mass% or more;

the content of the boron element is higher than that of the phosphorus element; and

the oxidation-resistant coating layer has a thickness of 0.5 μm or more.

In the oxidation resistant coating layer, a compound using boron and phosphorus is generated. This compound exhibits better oxidation resistance than that achieved by a compound containing only a phosphorus element or a boron element.

Further, the boron content and the phosphorus content as claimed in the present invention maximizes the respective oxidation of boron and phosphorus. This is proven by the Examples and the Comparative Examples of the present invention. See Examples 1 and 2 and Comparative Examples 1, 2 and 3 and the table in Figure 1 of the specification.

The amounts of B and P given in Example 1 correspond to Claim 1 and the amounts given in Example 2 correspond to Claim 25.

A high oxidation resistance is not achieved if the specific amounts of boron and phosphorous are not satisfied: e.g. when the oxidation-resistant coating layer contains only one of a boron element and a phosphorus element; when the boron content < the phosphorus content; or when the boron content and the phosphorus content fall short of the claimed ranges. A comparison of Examples 1, 2, and 3 according to the present invention with Comparative Examples 1 and 2 shows that when only one of B or P is used, the rate of oxidation loss is very high. In contrast if the combination of B and P is used, the oxidation loss can be reduced dramatically. In addition, if the amount of B and P is too low as in Comparative Example 3, the rate of oxidation loss is very high even though both elements are used. This cannot be predicted based on Olstowski.

The present invention defines the content of the boron and that of phosphorus in the oxidation-resistant coating **layer**. Olstowski, on the other hand, indicates the proportion of the oxidation-resistant agent in the **entire** shaped expanded graphite **article**. Further, Olstowski merely indicates a calcination process at a temperature within the range of 800°C to 1200°C in an atmosphere without oxygen, and an oxidation resistance of an example in a

calcination process at a temperature of 500°C in an atmosphere with oxygen. Therefore, the disclosed proportion of the oxidation-resistant agents of Olstowski does not lead to the proportion of boron and phosphorus in the oxidation-resistant coating layer (particularly, the boron content > the phosphorus content), nor does it lead to the effect achieved by the proportion of boron and phosphorus (the oxidation resistance at 800°C). As previously stated, there is a significant difference between 500°C and 800°C, when evaluating a carbon material in an atmosphere of oxygen.

Thus, withdrawal of the rejection over Olstowski is requested.

§103(a) Rejections (Claims 15-18)

Amended Claim 15 relates to a method for producing a shaped expanded graphite article having an oxidation-resistant coating layer, comprising

contacting graphite as a material with a solution comprising a phosphorus element and a boron element, thereby forming a coating layer of said solution on a surface of said graphite,

subjecting said graphite to an expanding treatment, and then

shaping said graphite.

In other words, in Claim 15, the graphite is coated, expanded by heat treatment and then shaped.

In contrast, Olstowski discloses heat treatment of a mixture of expanded graphite powder and an oxidation resistant agent. See col. 5, ln. 17-50 and col. 6, ln. 1-6 of the reference which disclose that a solid polymer or other bonding agents can be dissolved in a solvent and then sprayed on the vermicular expanded graphite prior to compaction. The

bonding agent-vermicular graphite blend should be baked at a temperature of from 800 to 1200°C.

In other words, an expanded graphite is coated in Olstowski, while in the present invention, a graphite is coated and then expanded.

Moreover, the specific combination of boron and phosphorus is not disclosed or suggested in Olstowski. The specification of the present invention discloses the advantages obtained when using a combination of B and P for the surprising improvement of the oxidation loss at 800 degrees C. See page 3, ln. 15-17, page 12, ln. 3-9 and the Examples, in particular the table in Figure 1. It is said that in the oxidation resistant coating layer of the present invention, a compound using boron and phosphorus is generated. This compound exhibits better oxidation resistance than that achieved by a compound containing only one of a phosphorus element and a boron element.

A comparison of Examples 1, 2, and 3 according to the present invention with Comparative Examples 1 and 2 shows that when only one of B or P is used, the rate of oxidation loss is very high. In contrast if the combination of B and P is used, the oxidation loss can be reduced dramatically. This cannot be predicted based on Olstowski.

Thus, withdrawal of the rejection over Olstowski is requested.

Conclusion

For the reasons discussed above, Applicants submit that all now-pending claims are in condition for allowance. Applicants respectfully request the withdrawal of the rejections and passage of this case to issue.

Respectfully submitted,

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